

Name \_\_\_\_\_

## Keystone Warm-ups

### Chapter 13: RNA and Protein Synthesis

*Copy down all 4 answer choices for the daily warm-up from the board in the space below its question. Choose the best answer by circling its letter. Then, after we go over it, write the correct answer in the block provided on the front of the packet.*

1	2	3	4	5
6	7	8	9	10
11	12	13	14	

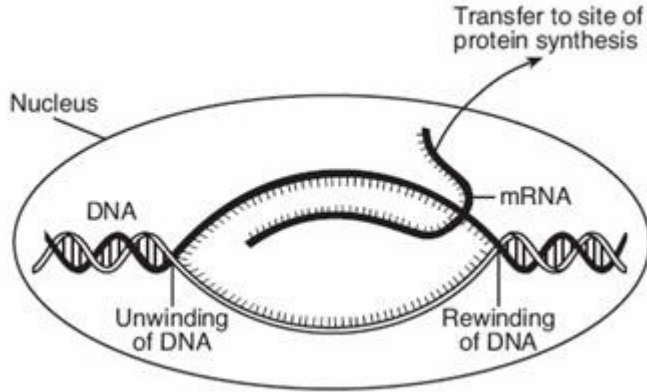
1. Which statement best describes the relationship between cells, DNA, and proteins?

- (A) Cells contain DNA that controls the production of proteins.
- (B) DNA is composed of proteins that carry coded information for how cells function.
- (C) Proteins are used to produce cells that link amino acids together into DNA.
- (D) Cells are linked together by proteins to make different kinds of DNA molecules.

2. Which statement describes a cell process that is common to both eukaryotic and prokaryotic cells?

- (A) Both cell types carry out transcription in the nucleus.
- (B) Both cell types use ribosomes to carry out translation.
- (C) Both cell types assemble amino acids to carry out transcription.
- (D) Both cell types carry out translation in the endoplasmic reticulum.

3. The diagram below shows some of the steps in protein synthesis.



The section of DNA being used to make the strand of mRNA is known as a

- (A) carbohydrate
- (B) ribosome
- (C) gene
- (D) chromosome

4. Why does mature mRNA contain fewer bases to be translated than its corresponding DNA sequence?

- (A) the final mRNA contains only exons, as the introns are removed
- (B) the final mRNA contains only introns, as the exons are removed
- (C) mRNA contains neither introns nor exons
- (D) none of the above because DNA actually has fewer bases than mature mRNA

5.

In DNA, a sequence of three bases is a code for the placement of a certain amino acid in a protein chain. The table below shows some amino acids with their abbreviations and DNA codes.

Amino Acid	Abbreviation	DNA Code
Phenylalanine	Phe	AAA, AAG
Tryptophan	Try	ACC
Serine	Ser	AGA, AGG, AGT, AGC, TCA, TCG
Valine	Val	CAA, CAG, CAT, CAC
Proline	Pro	GGA, GGG, GGT, GGC
Glutamine	Glu	GTT, GTC
Threonine	Thr	TGA, TGG, TGT, TGC
Asparagine	Asp	TTA, TTG

Which amino acid chain would be produced by the DNA base sequence below?

**C-A-A-G-T-T-A-A-A-T-T-A-T-T-G-T-G-A**

- A Val—Glu—Phe—Asp—Thr—Asp
- B Val—Pro—Phe—Asp—Asp—Thr
- C Val—Glu—Phe—Asp—Asp—Thr
- D Val—Glu—Phe—Thr—Asp—Asp

6. The photographs to the right show some physical similarities between John Lennon and his son Julian.

Which conclusion can be drawn regarding these similarities?

- (A) The DNA present in their bodies is identical.
- (B) The percentage of their proteins with the same molecular composition is high.
- (C) The base sequences of their genes are identical.
- (D) The mutation rate is the same in their body cells.



Lewis, Ricki *Life* 3rd edition WCB/McGraw Hill

7. The sequence of subunits in a protein is most directly dependent on the

- (A) region in the cell where enzymes are produced
- (B) DNA in the chromosomes in a cell
- (C) type of cell in which starch is found
- (D) kinds of materials in the cell membrane

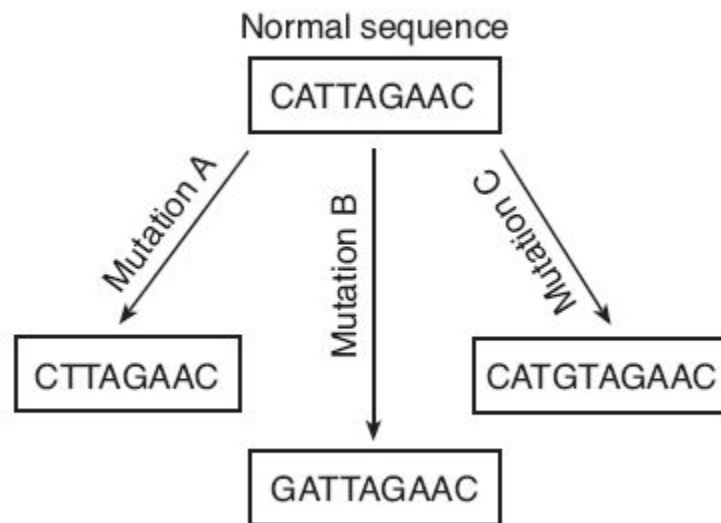
8. A mutation occurs in the genes that code for coat color in deer. Which change will most likely result from this mutation?

- (A) a change in the selection pressures acting on coat color
- (B) a change in the coat-color genes of deer predator species
- (C) an increase in coat-color diversity in the population
- (D) an increase in the number of genes for coat color in the population

9. A genetic mutation resulted in a change in the sequence of amino acids of a protein, but the function of the protein was not changed. Which statement best describes the genetic mutation?

- (A) It was a silent mutation that caused a change in the DNA of the organism.
- (B) It was a silent mutation that caused a change in the phenotype of the organism.
- (C) It was a nonsense mutation that caused a change in the DNA of the organism.
- (D) It was a nonsense mutation that caused a change in the phenotype of the organism.

10. The diagram below shows a normal gene sequence and three mutated sequences of a segment of DNA.



Which row in the chart below correctly identifies the cause of each type of mutation?

	<b>Mutation A</b>	<b>Mutation B</b>	<b>Mutation C</b>
<b>A</b>	Deletion	Substitution	Insertion
<b>B</b>	Insertion	Substitution	Deletion
<b>C</b>	Insertion	Deletion	Substitution
<b>D</b>	Deletion	Insertion	Substitution

11. Which statement is true regarding an alteration or change in DNA?

- (A) It is always known as a mutation.
- (B) It is always advantageous to an individual.
- (C) It is always passed on to offspring.
- (D) It is always detected by the process of chromatography.

12. A mutation occurs in a cell. Which sequence best represent the correct order of the events involved for this mutation to affect the traits expressed by this cell?

(A) joining amino acids in sequence → a change in the sequence of DNA bases → appearance of a characteristic

(B) appearance of a characteristic → joining amino acids in sequence → a change in the sequence of DNA bases

(C) a change in the sequence of DNA bases → appearance of a characteristic → joining amino acids in sequence

(D) a change in the sequence of DNA bases → joining amino acids in sequence → appearance of a characteristic

13. A change in the order of DNA bases that code for a respiratory protein will most likely cause

(A) the production of a starch that has a similar function

(B) the digestion of the altered gene by enzymes

(C) the release of antibodies by certain cells to correct the error

(D) a change in the sequence of amino acids determined by the gene

14. In the human pancreas, acinar cells produce digestive enzymes and beta cells produce insulin. The best explanation for this is that

(A) a mutation occurs in the beta cells to produce insulin when the sugar level increases in the blood

(B) different parts of an individual's DNA are used to direct the synthesis of different proteins in different types of cells

(C) lowered sugar levels cause the production of insulin in acinar cells to help maintain homeostasis

(D) the genes in acinar cells came from one parent while the genes in beta cells came from the other parent